

1 transmitting the continuous phase modulated signal,  
2 receiving the continuous phase modulated signal,  
3 [demodulating the continuous phase modulated signal into a  
4 received baseband signal,] and  
5 filtering the [received baseband] continuous phase modulated  
6 signal into a sequence of filtered signals having absolute phase  
7 for indicating the sequence of data symbols.

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9 2. (Once Amended) The method of claim 1 further comprising the  
10 steps of ,

11 sampling the sequence of filtered signals into a sequence of  
12 sampled [signals] symbols, and

13 [decoding] demodulating the sequence of sampled symbols  
14 [signals] into an estimated data stream.

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16 3. (Once Amended) The method of claim 1 wherein,

17 the generating step comprises the steps of receiving the data  
18 stream of data bits, formatting the data stream into the sequence  
19 of formatted data pulses as a sequence of data symbols within an M-  
20 ary symbol set,

21 the modulating step comprises the steps of Gaussian filtering  
22 and frequency modulating for generating the continuous phase  
23 modulated signal, the Gaussian filter step filters the precoded  
24 sequence of data symbols into pulse responses continuously  
25 accumulated over a finite memory time as a filter response, the  
26 Gaussian filtering step is defined by a bandwidth time product  
27 inversely defining the finite memory time, the frequency modulating  
28 step frequency modulates a carrier reference by the filter response

1 by a modulation index for converting the filter response into the  
2 continuous phase modulated signal,

3 the [demodulating step is carrier demodulating step for  
4 demodulating the] continuous phase modulated signal is up converted  
5 from baseband during the transmitting step and is down converted to  
6 baseband during the receiving step using a local carrier [into the  
7 baseband signal, the carrier demodulating step further removes a  
8 carrier phase offset between the local carrier and the received  
9 continuous phase modulated signal], and

10 the filtering step is a matched filtering step for matched  
11 filtering of the received [baseband signal] continuous phase  
12 modulated signal into the filtered signal, the matched filtering is  
13 matched by pulse amplitude modulation representation to the  
14 Gaussian filtering step, the filtered signal has an absolute phase  
15 at a periodic sampling time for indicating the sequence of data  
16 symbols.

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18 4. (Twice Amended) The method of claim 3 wherein,

19 the modulation index is equal to a fraction selected from a  
20 group consisting of  $1/M$  and  $(1-1/M)$  fractions for the M-ary symbol  
21 set where  $M=2^k$  and k is an integer.

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23 5. (Twice Amended) A method for communicating a data stream, the  
24 method comprising the steps of,

25 generating a sequence of data symbols from the data stream by  
26 formatting the data stream into the sequence of formatted data  
27 pulses as a sequence of data symbols within a 2-ary symbol set,

1        precoding the sequence of data symbols into a sequence of  
2 precoded data symbols,

3        Gaussian filtering the precoded sequence of data symbols into  
4 pulse responses continuously accumulated over a finite memory time  
5 as a filter response, the Gaussian filtering is defined by a  
6 bandwidth time product inversely defining the finite memory time,  
7        frequency modulating a carrier reference by the filter  
8 response by a modulation index for converting the filter response  
9 into a continuous phase modulated signal,

10       [demodulating the continuous phase modulated signal by a local  
11 carrier and by a carrier phase offset into a received baseband  
12 signal,] and

13       matched filtering the received [baseband signal] continuos  
14 phase modulation signal into a filtered signal, the matched  
15 filtering is matched by pulse amplitude modulation representation  
16 to the Gaussian filtering, the filtered signal has an absolute  
17 phase at a periodic sampling time for indicating the sequence of  
18 data symbols.

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20 11. (Twice Amended) A method for communicating a data stream, the  
21 method comprising the steps of,

22        generating a sequence of data symbols from the data stream by  
23 formatting the data stream into the sequence of formatted data  
24 pulses as a sequence of data symbols within a[n] 4-ary symbol set,

25        precoding the sequence of data symbols into a sequence of  
26 precoded data symbols,

27        Gaussian filtering the precoded sequence of data symbols into  
28 pulse responses continuously accumulated over a finite memory time

1 as a filter response, the Gaussian filtering is defined by a  
2 bandwidth time product inversely defining the finite memory time,  
3 frequency modulating a carrier reference by the filter  
4 response by a modulation index for converting the filter response  
5 into a continuous phase modulated signal,  
6 [demodulating the continuous phase modulated signal by a local  
7 carrier and by a carrier phase offset into a received baseband  
8 signal, and]  
9 matched filtering the [received baseband signal] continuous  
10 phase modulated signal into a filtered signal, the matched  
11 filtering is matched by pulse amplitude modulation representation  
12 to the Gaussian filtering, the filtered signal has an absolute  
13 phase at a periodic sampling time for indicating the sequence of  
14 data symbols, and  
15 demodulating the sequence of data symbols into an estimate of  
16 the data steam.

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AMENDED CLAIMS and REWRITTEN

1. (Once Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,  
generating a sequence of data symbols from the data stream,  
precoding the sequence of data symbols into a sequence of precoded data symbols,  
modulating the sequence of precoded data symbols into a continuous phase modulated signal,  
transmitting the continuous phase modulated signal,  
receiving the continuous phase modulated signal, and  
filtering the continuous phase modulated signal into a sequence of filtered signals having absolute phase for indicating the sequence of data symbols.

2. (Once Amended and Rewritten) The method of claim 1 further comprising the steps of ,  
sampling the sequence of filtered signals into a sequence of sampled signals, and  
demodulating the sequence of sampled signals into an estimated data stream.

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1 3. (Once Amended and Rewritten) The method of claim 1 wherein,  
2 the generating step comprises the steps of receiving the data  
3 stream of data bits, formatting the data stream into the sequence  
4 of formatted data pulses as a sequence of data symbols within an M-  
5 ary symbol set,  
6 the modulating step comprises the steps of Gaussian filtering  
7 and frequency modulating for generating the continuous phase  
8 modulated signal, the Gaussian filter step filters the precoded  
9 sequence of data symbols into pulse responses continuously  
10 accumulated over a finite memory time as a filter response, the  
11 Gaussian filtering step is defined by a bandwidth time product  
12 inversely defining the finite memory time, the frequency modulating  
13 step frequency modulates a carrier reference by the filter response  
14 by a modulation index for converting the filter response into the  
15 continuous phase modulated signal,  
16 the continuous phase modulated signal is up converted from  
17 baseband during the transmitting step and is down converted to  
18 baseband during the receiving step using a local carrier, and  
19 the filtering step is a matched filtering step for matched  
20 filtering of the received continuous phase modulated signal into  
21 the filtered signal, the matched filtering is matched by pulse  
22 amplitude modulation representation to the Gaussian filtering step,  
23 the filtered signal has an absolute phase at a periodic sampling  
24 time for indicating the sequence of data symbols.

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1 4. (Twice Amended and Rewritten) The method of claim 3 wherein,  
2 the modulation index is equal to a fraction selected from a  
3 group consisting of  $1/M$  and  $(1-1/M)$  fractions for the M-ary symbol  
4 set where  $M=2^k$  and k is an integer.

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8 5. (Twice Amended and Rewritten) A method for communicating a  
9 data stream, the method comprising the steps of,  
10 generating a sequence of data symbols from the data stream by  
11 formatting the data stream into the sequence of formatted data  
12 pulses as a sequence of data symbols within a 2-ary symbol set,  
13 precoding the sequence of data symbols into a sequence of  
14 precoded data symbols,  
15 Gaussian filtering the precoded sequence of data symbols into  
16 pulse responses continuously accumulated over a finite memory time  
17 as a filter response, the Gaussian filtering is defined by a  
18 bandwidth time product inversely defining the finite memory time,  
19 frequency modulating a carrier reference by the filter  
20 response by a modulation index for converting the filter response  
21 into a continuous phase modulated signal, and  
22 matched filtering the received continuous phase modulation  
23 signal into a filtered signal, the matched filtering is matched by  
24 pulse amplitude modulation representation to the Gaussian  
25 filtering, the filtered signal has an absolute phase at a periodic  
26 sampling time for indicating the sequence of data symbols.

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11. (Twice Amended and Rewritten) A method for communicating a data stream, the method comprising the steps of,

generating a sequence of data symbols from the data stream by formatting the data stream into the sequence of formatted data pulses as a sequence of data symbols within a 4-ary symbol set, precoding the sequence of data symbols into a sequence of precoded data symbols,

Gaussian filtering the precoded sequence of data symbols into pulse responses continuously accumulated over a finite memory time as a filter response, the Gaussian filtering is defined by a bandwidth time product inversely defining the finite memory time, frequency modulating a carrier reference by the filter response by a modulation index for converting the filter response into a continuous phase modulated signal,

matched filtering the continuous phase modulated signal into a filtered signal, the matched filtering is matched by pulse amplitude modulation representation to the Gaussian filtering, the filtered signal has an absolute phase at a periodic sampling time for indicating the sequence of data symbols, and

demodulating the sequence of data symbols into an estimate of the data stream.

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